REMARKS

Claims 1-65 are pending in the application, of which Claims 1, 24, 29, 52, 57, 59, 60, 64 and 65 are independent. Claims 1-14, 17-42, 45 and 47-65 have been rejected. This rejection is respectfully traversed and reconsideration is requested. The Applicants note with appreciation the indication of allowability of Claims 15, 16, 43, 44 and 46.

Claim Amendments

Claims 25-28, 30-42, 44, 45-51, 53-56, 58, 61 and 63 have been amended to correct typographical mistakes in indicating claim dependencies. No new matter has been added. All claims are now believed to be in condition for allowance.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-4, 7, 8, 12, 14, 17, 18, 20-22, 24-32, 35, 36, 40, 42, 45, 48-50 and 52-65 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Beier (U.S. Patent No. 5,933,820). This rejection is respectfully traversed and reconsideration is requested.

The present application is directed to a mechanism for reducing the cost of forwarding pointer aliasing. Each object is assigned a short random tag, to be stored in each pointer to the object. This tag is similar in role to the unique identifier (UID), but it is not necessarily unique. These tags are referred to as short quasi-unique identifiers, or SQUIDs. Because SQUIDs are not unique, they can be much shorter than UIDs, comparing only a small number of bits, while still providing similar functionality. Furthermore, SQUIDs do not require any translation tables, because they are a part of the pointer format. A pointer to an object may also be associated with a migration indicator field, which indicates the number of migrations of the referenced data object prior to the pointer being created. A comparator determines that two pointers do not reference the same data object if their associated migration indicators indicate identical numbers of migrations and that corresponding addresses are different.

Beier is directed to a database management system that internally uses direct and indirect pointing to locate the targeted data elements by assigning a unique identifier of the targeted data element to each data element that points to the targeted data element (Abstract, ll. 1-3, 15 and 16). Each targeted data element has an entry in an indirect index where the unique identifier is a

key into the index. Each entry is updated with a new location whenever the targeted data element is moved (Abstract, ll. 14-21). Each unique id is maintained for life across multiple reorganizations and does not change during a reorganization (Column 6, ll. 30-33). The indirect access to data that has been physically relocated "is performed by using a very large table entry number as the key of a record in an index, which is an internally managed secondary index that provides a unique method of indirect pointing" (Column 9, ll. 64-67).

Beier does not teach or suggest using a short quasi-unique identifier (SQUID) to point to a particular data object, as claimed in, for example, independent Claims 1, 29 and 62. Instead, Beier specifically requires <u>unique</u> identifiers and teaches away from using quasi-unique identifiers by stating that "the unique ids are never reused" (Column 12, l. 38). As is used throughout the pending claims and as defined in the specification, a SQUID is a not necessarily unique identifier, and multiple pointers may have the same SQUID while pointing to different objects in memory. Therefore, a SQUID is patently distinct from a guaranteed unique identifier of Beier.

The Examiner states that Beier discloses SQUIDs as being "comprised of a unique identifier and a reorganization number". The Applicants respectfully disagree. Beier does not recite combining a unique identification number with a reorganization number – they are both merely used to keep track of data after reorganization. However, even if they were combined, *arguendo*, the combination would not result in a short quasi-unique identifier of the present invention, because this combination would be, by definition, unique.

Furthermore, SQUIDS are short identifiers, and Beier specifically teaches away from using short identification numbers by stating that the "indirect access to data that has been physically relocated is then done by using a <u>very large table entry number</u> as the key of a record in an index" (Column 9, ll. 63-65). A short identifier claimed in the present application is patently distinct from a very large table entry number. Therefore, independent Claims 1, 29 and 62 are not anticipated by Beier and the rejection should be withdrawn. Dependent Claims 2-4, 7, 8, 12, 14, 17, 18, 20-22, 35, 36, 40, 42, 45, 48-50 and 63 depend on independent Claims 1, 29 and 62, respectively and, therefore, are not anticipated by Beier for at least the same reasons as above.

In addition, in regard to dependent Claims 12, 14, 40, 42, 58, 61 and 63, the Examiner states that "Beier discloses a comparator which compares SQUIDs associated with two different pointers wherein the comparator...determines that the two pointers reference the same data object if the SQUIDs are identical and the address fields of the two pointers are identical." The Applicants respectfully disagree. The sections of Beier cited by the Examiner discuss only comparing a reorganization number of the pointer and a reorganization number of the index table to determine whether the direct pointer is valid and can be used. Nowhere does Beier discuss comparing both unique identifiers of two pointers and address fields of the two pointers, because such a comparison would not be necessary in a system where all identifiers are unique. The situation where two identifiers are identical, but the two indirect pointers do not reference the same data object is not possible in the system of Beier. Therefore, Claims 12, 14, 40, 42, 58, 61 and 63 are not anticipated by Beier.

With respect to independent Claims 24, 52, 59, 64, and 65, while Beier does disclose reorganization numbers that denote data migrations, Beier does not teach or suggest a comparator that determines that two pointers do not reference the same data object if their associated migration indicators indicate identical numbers of migrations and their corresponding addresses are different. The reorganization numbers of Beier are used only "to verify whether a reorganization number in a pointer set matches the current reorganization number in the storage table to indicate whether the direct pointer was valid and could be used. If the reorganization number matches the reorganization number in memory for the targeted partition, the RDA for the target in the pointer set is valid and can be used, i.e., the direct pointer in the pointer set can be used for direct reference" (Column 6, ll.64-68, Column 7, ll. 1-4). Nowhere does Beier suggest comparing not only the migration indicators, but also corresponding addresses to determine whether two pointers reference the same data object, as is claimed in independent Claims 24, 52, 59, 64 and 65. Therefore, these claims are not anticipated by Beier and the rejection should be withdrawn. Dependent claims 25-28 and 53-56 depend on independent Claims 24 and 52, respectively, and, therefore, are not anticipated by Beier for at least the same reasons as above.

Claim Rejections Under 35 U.S.C. § 103

Claims 5 and 33 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of Black (U.S. Patent No. 5,325,524). Claims 6 and 34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of Flood (U.S. Patent No. 6,560,619). Claims 9 and 37 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of DiLullo (U.S. Patent No. 5,025,253). Claims 10 and 38 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of Armstrong (U.S. published application No. 20020175805). Claims 11 and 39 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of O'Hare (U.S. published application No. 20010027501). Claims 13 and 41 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of the submitted prior art Luk ("Memory Forwarding: Enabling Aggressive Layout). Claims 19 and 47 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier in view of the submitted prior art Carter (U.S. Patent No. 5,845,331). Claims 23 and 51 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beier These rejections are all respectfully traversed and reconsideration is requested.

As discussed above, Beier does not teach or suggest using short quasi-unique identifiers as part of a pointer to a particular data object. None of the above references supplement this failing of Beier to teach SQUIDs. Furthermore, none of the cited references supplement the failing of Beier to teach a comparator that determines that two pointers do not reference the same data object if their associated migration indicators indicate an identical number of migrations and the corresponding addresses are different. Therefore, Claims 5, 6, 9, 10, 11, 13, 19, 23, 33, 34, 37, 38, 39, 41, 47 and 51 are not obvious in view of Beier or the combinations of Beier with each of the cited references and the rejections should be withdrawn. All claims are now believed to be in condition for allowance.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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